

# The Connected Machine Shop

## Building the Digital Thread

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Sandvik Coromant

# Next phase in the industrial revolution



## 1<sup>st</sup> industrial revolution

Water and steam power paved the way for mechanical manufacturing facilities.



## 2<sup>nd</sup> industrial revolution

Follows the introduction of electricity-powered mass production based on the division of labor.



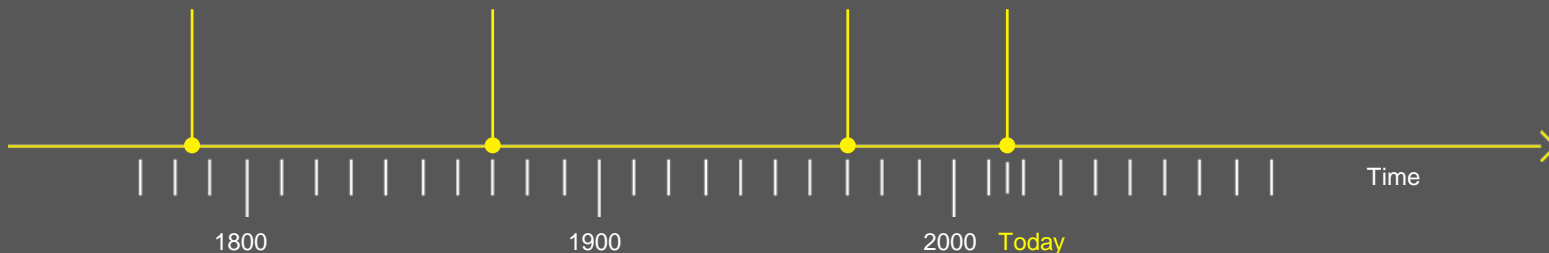
## 3<sup>rd</sup> industrial revolution

Electronics and IT to advance automation in manufacturing.



## 4<sup>th</sup> industrial revolution

Based on Cyber-Physical Systems.





# Reducing waste in the Machine Shop



**Pre-machining  
productivity**



**In-machining and  
system utilization**



**Energy flow  
through machinery**



**Degree of automation**



**Traceability**

No way to optimize process and operation planning due to poor input data quality

<50% utilization of individual machines

Only 1/3 of energy used for actual forming of manufactured parts

Key intelligence captured by experienced industrial practitioners who can't process data as effectively as algorithms

Only a fraction of data is recorded – and even if it is, it's not often analyzed or used for improvement and prediction

# Today's Machine Shop

## Typical value stream

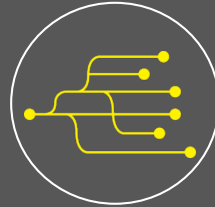
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Coromant



Design



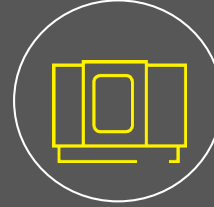
Process  
Planning



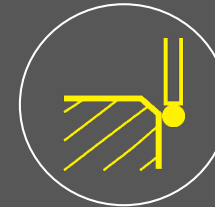
Operations  
Planning



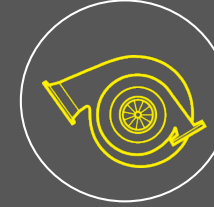
Production  
Logistics



Machining



Verification



Outbound  
Logistics

Design and Planning

In-Machining

Post-Machining

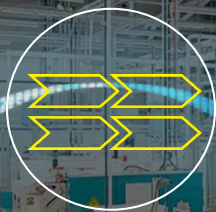


# Connected Machine Shop

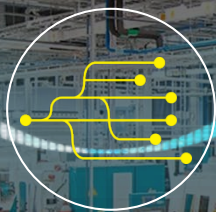
Digital Thread Connecting the Value Stream



Design



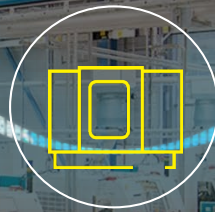
Process  
Planning



Operations  
Planning



Production  
Logistics



Machining



Verification



Outbound  
Logistics

Design and planning

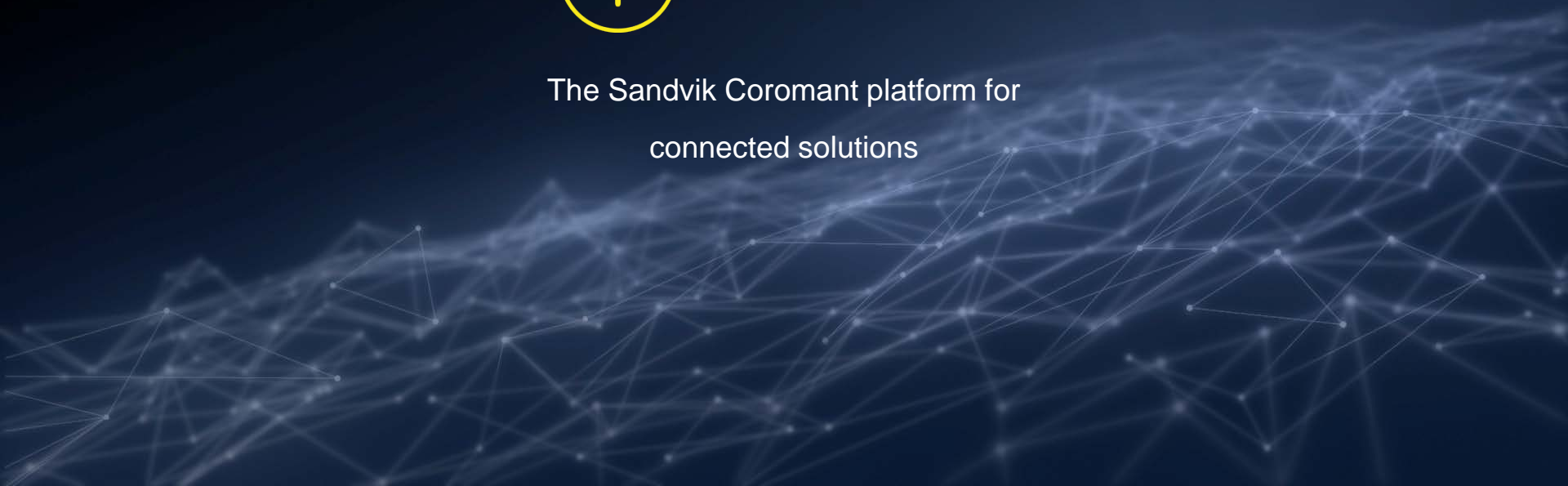
In-machining

Post-machining

The CoroPlus logo features a yellow plus sign inside a yellow circle, followed by the text "CoroPlus" in a bold, sans-serif font with a trademark symbol.

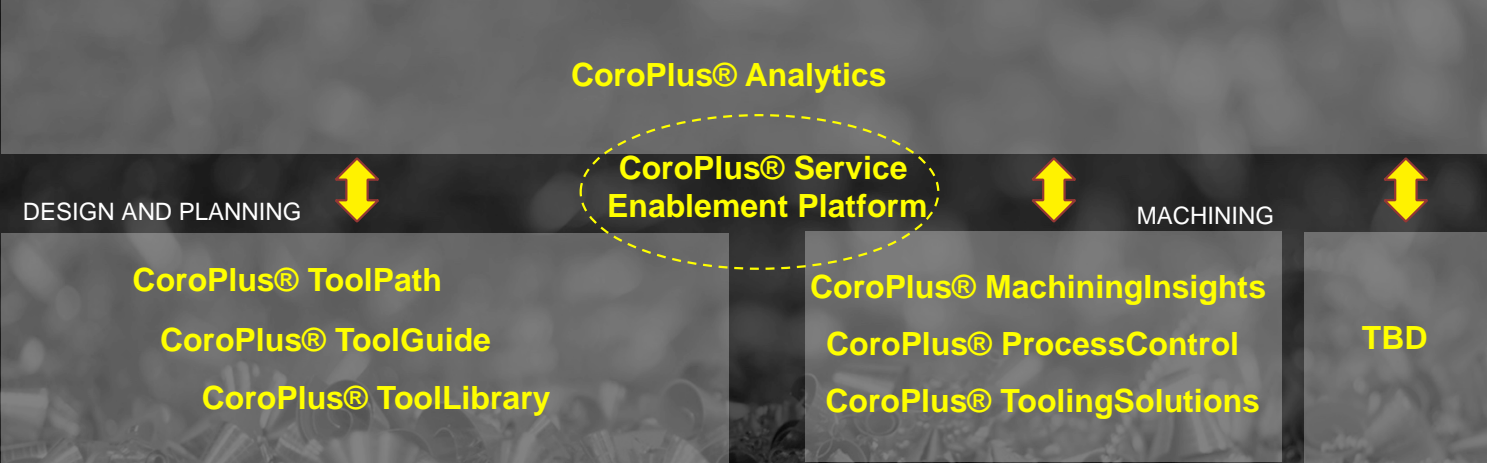
# CoroPlus™

The Sandvik Coromant platform for  
connected solutions

The background of the slide is a dark blue gradient with a complex network of white lines and dots, resembling a digital or data network, extending across the bottom and right sides of the image.

# CoroPlus® platform overview

ANALYTICS (MACHINING IN A MANUFACTURING CONTEXT)



Design



Process Planning



Operations Planning



Production Logistics



Machining



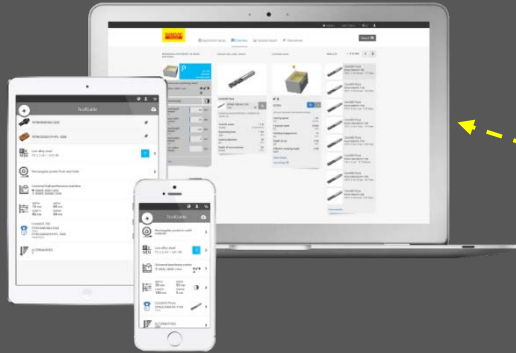
Verification



Outbound Logistics

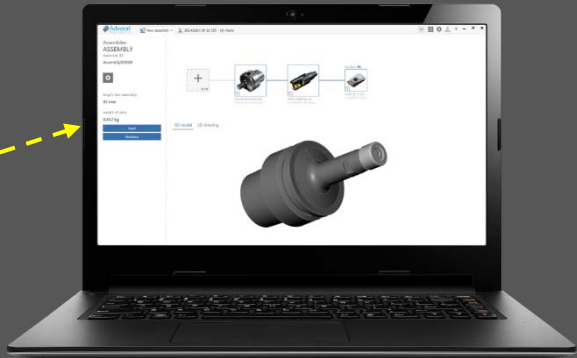


# CoroPlus<sup>®</sup> ToolGuide



CoroPlus<sup>™</sup> ToolGuide allows our partners to integrate our cutting data recommendations into their own software.

# CoroPlus<sup>®</sup> ToolLibrary

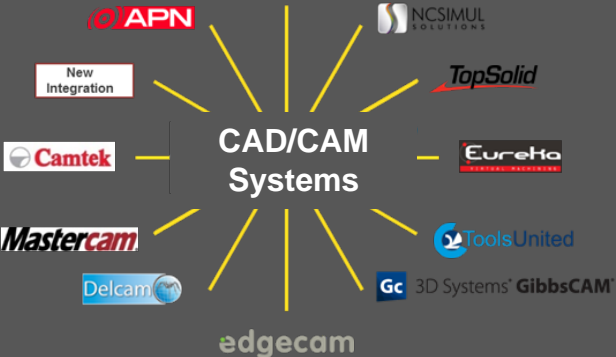


CoroPlus<sup>®</sup> Tool Library, built on ISO 13399. Open for all cutting tool suppliers.

Open API

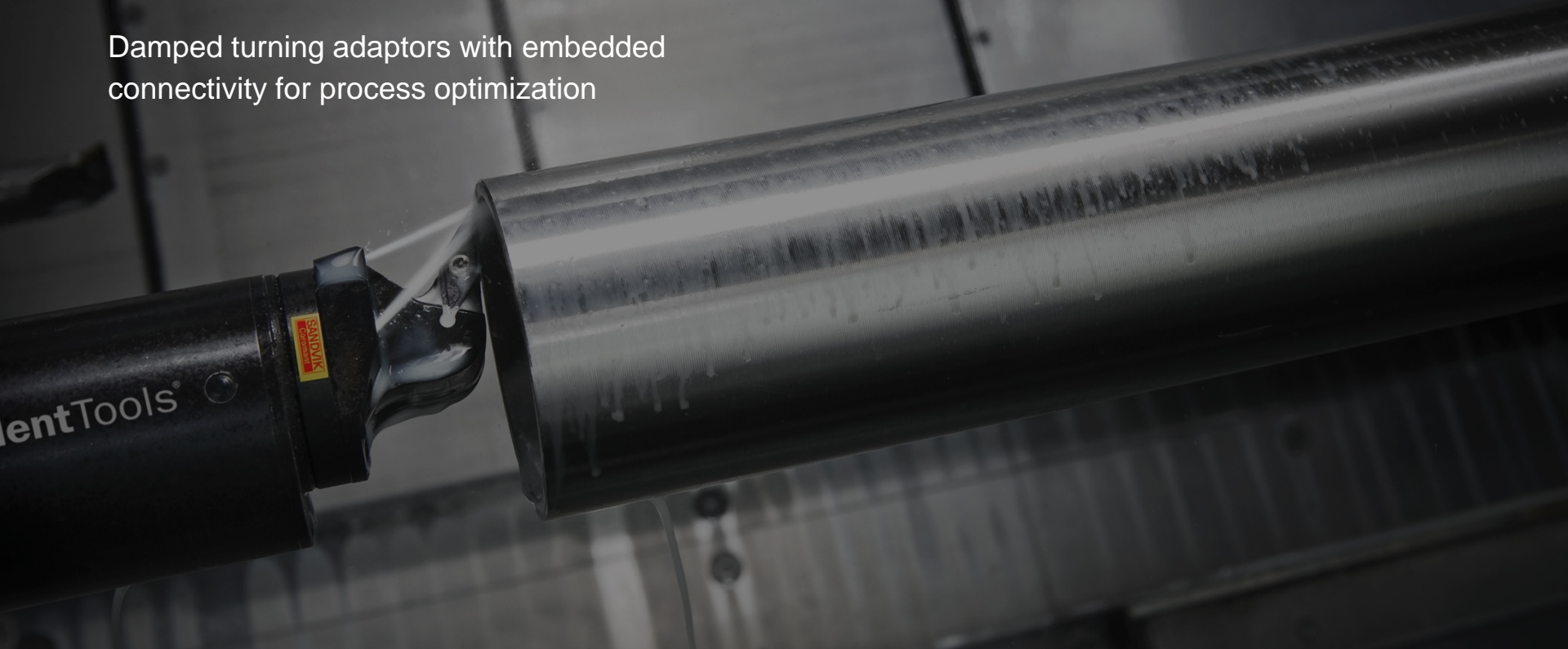


DWG MORI



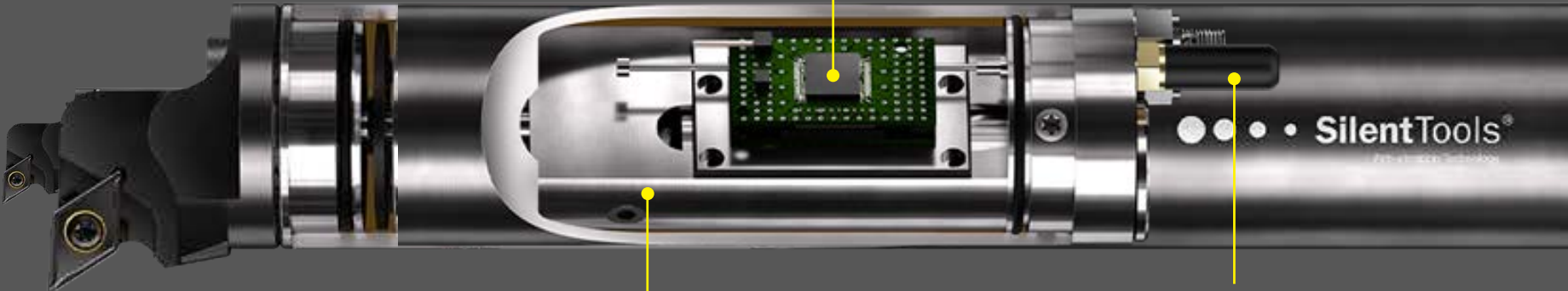
# Silent Tools™+

Damped turning adaptors with embedded connectivity for process optimization



# Silent Tools™+ Features

Sensors embedded  
in adaptor



Leading damping technology

Bluetooth data distribution

# Improved Set-up Efficiency and Precision



Quick set-up means  
time savings.



Easy center height  
adjustment.

CoroPlus™

Live View

Report

2h 18m remaining



# Live Process View

- Surface quality indicator
- Vibration indicator
- Damping system temperature
- Battery status
- Cut recording
- In-cut indicator





# Post Processing and Quality Control

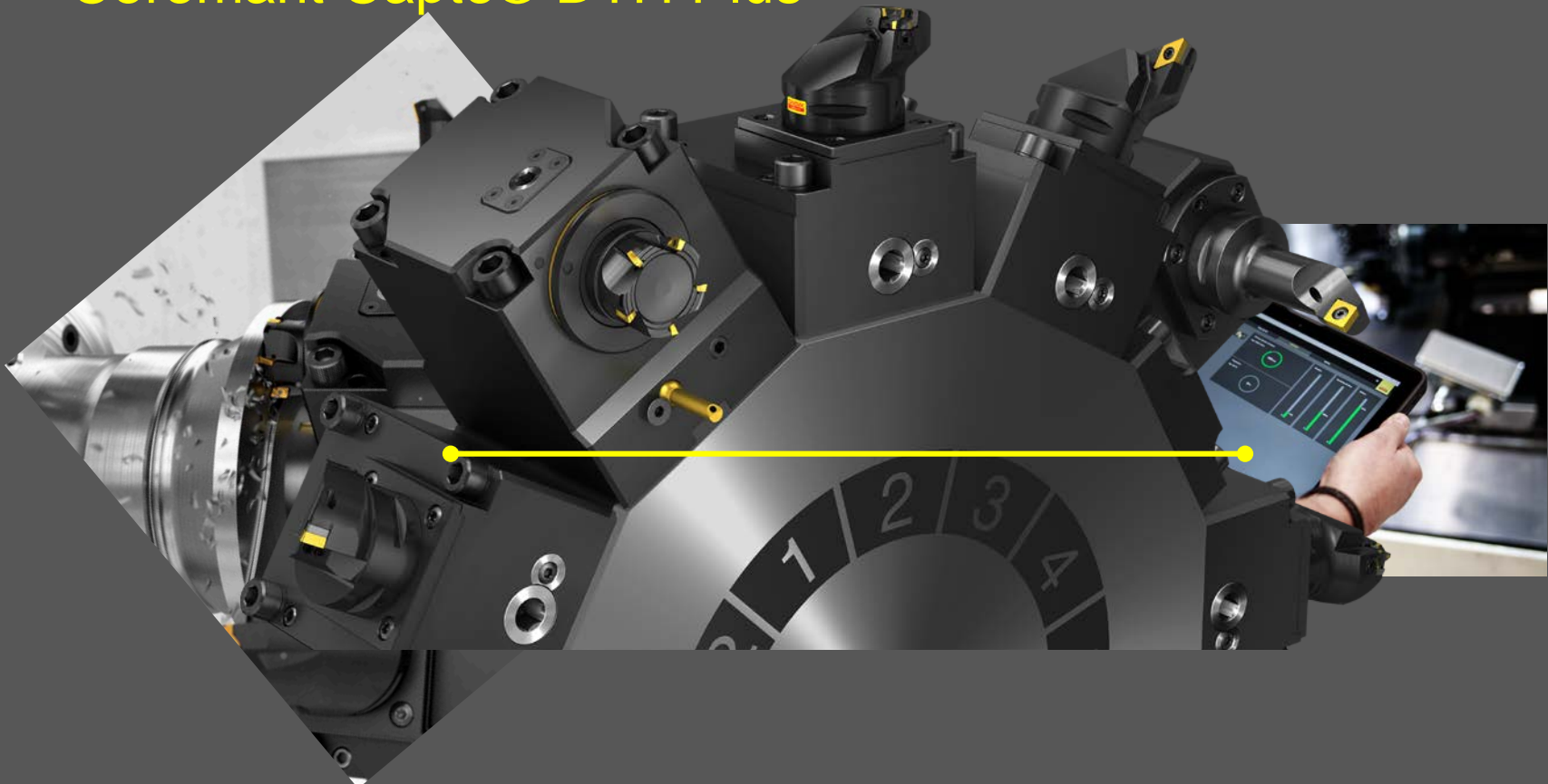
- Record and store cut data
- Quality control
- Trend graph



# Digital Tooling Solutions

## Coromant Capto® DTH Plus

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Coromant



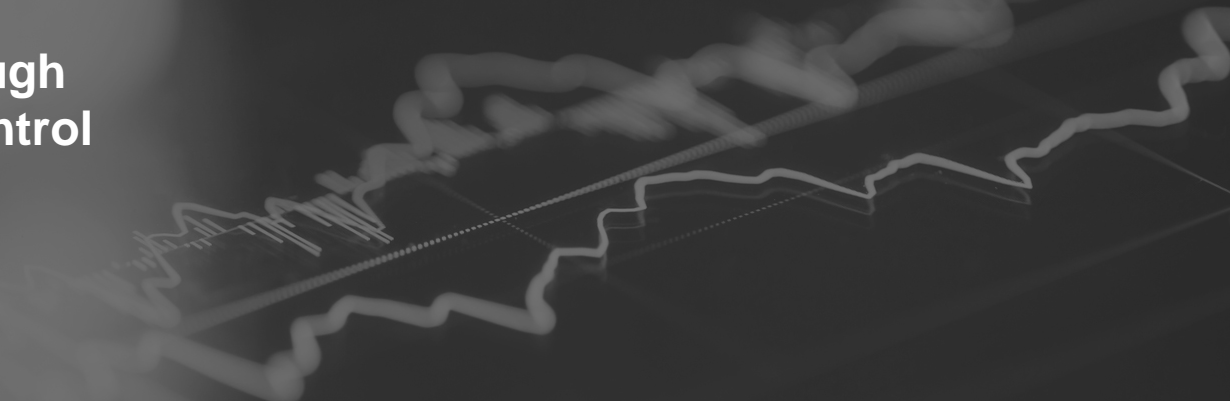
# CoroPlus® ProcessControl

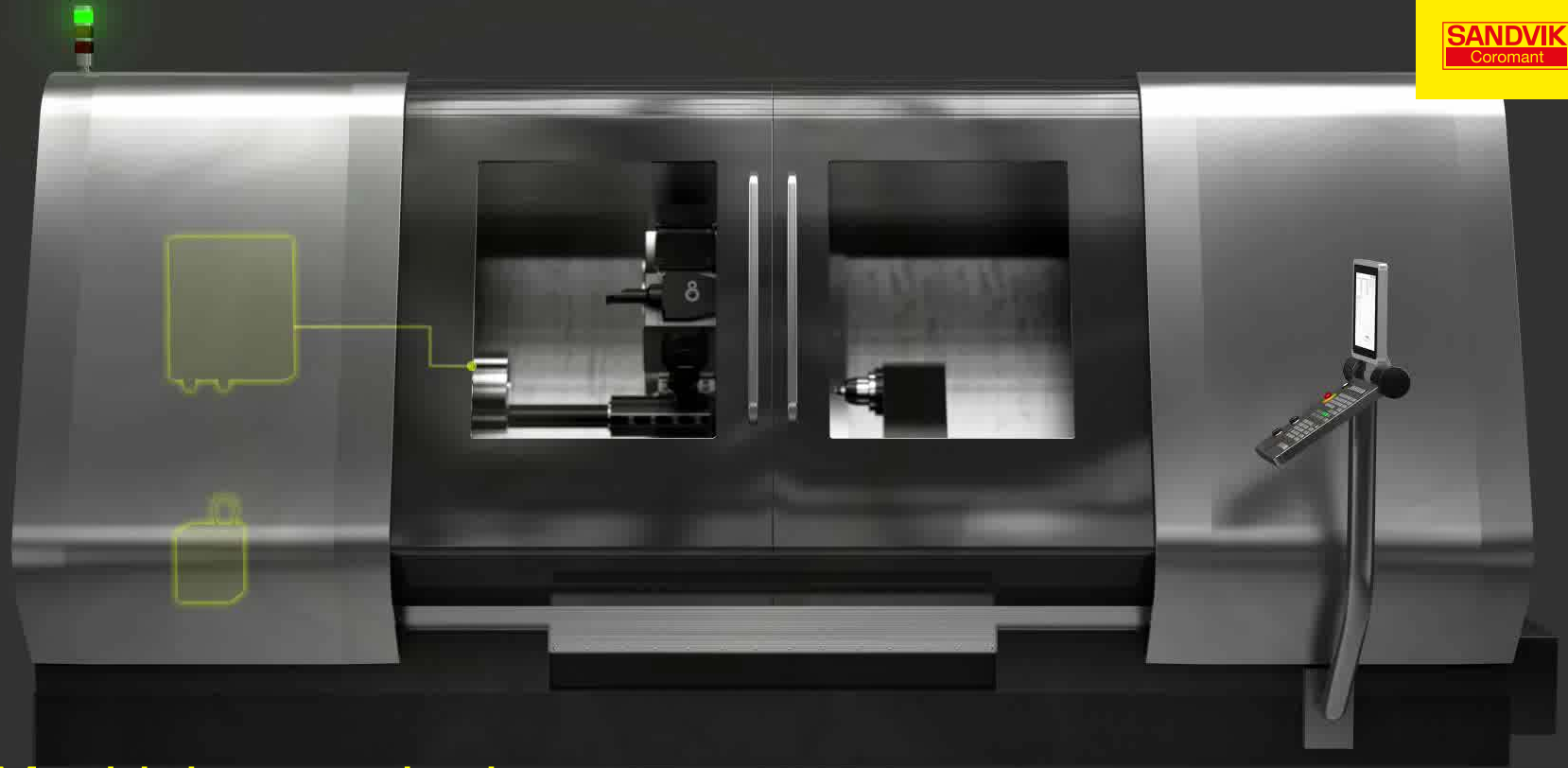


**Efficiency created through  
continuous process control**

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Machining monitoring

# CoroPlus® ProcessControl



Collision detector



Tool guard



# Connected Machine Shop?

Is the Andon light telling you the whole story?

# CoroPlus<sup>®</sup> Machining Insights

From data to actions

# Disturbances in manufacturing

Small stops

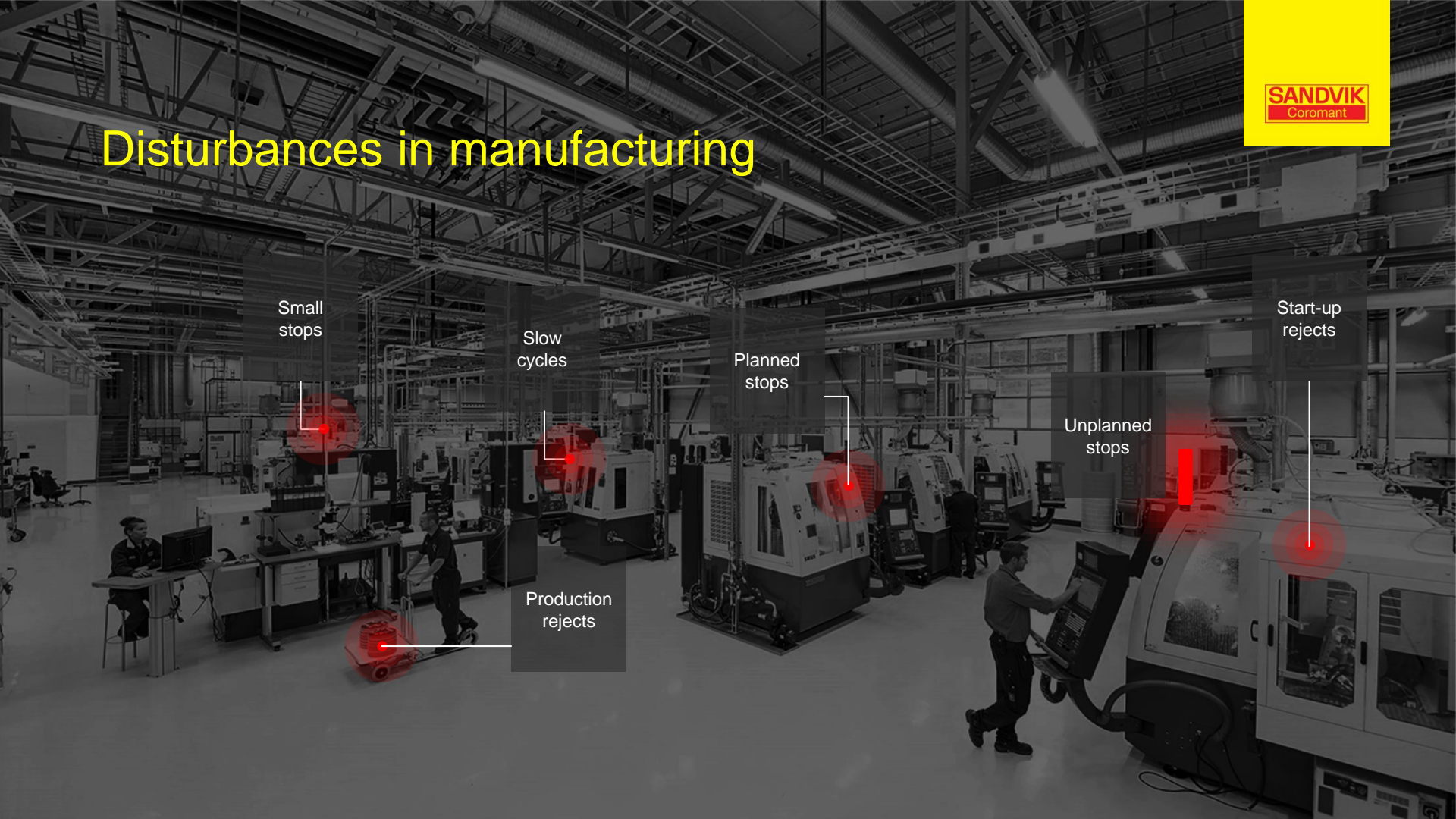
Slow cycles

Planned stops

Start-up rejects

Unplanned stops

Production rejects



# Typical methods to address the disturbances

- Manual tracking of utilization and downtime reasons
- Manual data aggregation
- Manual time studies
- Single events
- Resource and time consuming

# CoroPlus<sup>®</sup> MachiningInsights

**SANDVIK**  
Coromant

From data to insights

Data collection from  
machine and operator





# CoroPlus<sup>®</sup> MachiningInsights



# CoroPlus<sup>®</sup> MachiningInsights

SANDVIK  
Coromant

The screenshot shows the user interface of the CoroPlus MachiningInsights application. At the top left, the username 'sandvikpurnebane' is displayed. The main heading is 'Connected Machine Shop' in large yellow font, with the subtitle 'Insights you can't get from the Andon light' below it. The central logo features a yellow plus sign in a circle followed by 'CoroPlus<sup>®</sup> MachiningInsights'. The interface includes several navigation icons: a grid for 'Dashboards', a gauge for 'Reports', a person icon for 'Operator Panel', a bell for 'Alerts', a ticket for 'Tickets', a clipboard for 'Knowledge Base', a printer for 'Download Device Data', and a document for 'Docs'. The background is dark with a network-like pattern of white lines and dots.

sandvikpurnebane

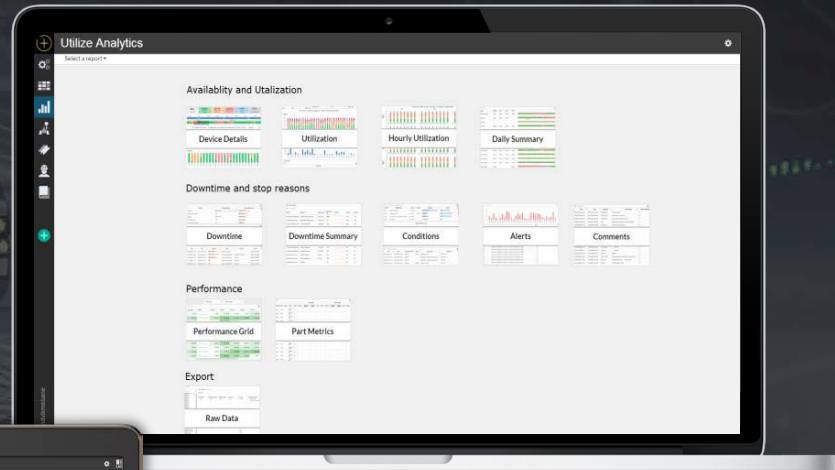
## Connected Machine Shop

Insights you can't get from the Andon light

**+** CoroPlus<sup>®</sup>  
MachiningInsights

- Dashboards
- Reports
- Operator Panel
- Alerts
- Tickets
- Knowledge Base
- Download Device Data
- Docs

# Demonstration



# Key Take Away

Think Big.  
Start Small.  
Move Fast.



# CoroPlus<sup>®</sup> Solutions

## Digital Machining:

<https://www.sandvik.coromant.com/en-us/products/pages/digital-machining.aspx>

## CoroPlus:

[https://www.sandvik.coromant.com/en-us/campaigns/pages/coroplus.aspx?internal\\_camplink=coroplus&internal\\_camplink\\_type=highlight](https://www.sandvik.coromant.com/en-us/campaigns/pages/coroplus.aspx?internal_camplink=coroplus&internal_camplink_type=highlight)

<https://www.youtube.com/watch?v=|RQGx2h9pR4>

## Design and Planning:

<https://www.sandvik.coromant.com/en-us/products/Pages/design-and-planning-solutions.aspx>

<https://www.youtube.com/watch?v=nxnpbXMyCqI>

<https://www.youtube.com/watch?v=vJHST7j4lyo>

<https://www.youtube.com/watch?v=wW7Gj35tgPo>

## In-Machining:

<https://www.sandvik.coromant.com/en-us/products/Pages/in-machining-solutions.aspx>

## ProcessControl:

<https://www.sandvik.coromant.com/en-us/products/coroplus-processcontrol/>

<https://www.youtube.com/watch?v=nfRjLPs3py0&t=25s>

## MachiningInsights:

<https://www.sandvik.coromant.com/en-us/products/Pages/coroplus-machininginsights.aspx>

<https://www.youtube.com/watch?v=nfRjLPs3py0&t=25s>

## ProcessControl:

<https://www.sandvik.coromant.com/en-us/products/coroplus-processcontrol/Pages/default.aspx>

## Silent Tools Plus:

[https://www.sandvik.coromant.com/en-us/products/silent\\_tools\\_turning/Pages/silent-tools-plus.aspx](https://www.sandvik.coromant.com/en-us/products/silent_tools_turning/Pages/silent-tools-plus.aspx)

[https://www.youtube.com/watch?v=\\_8izfcOGtl&t=11s](https://www.youtube.com/watch?v=_8izfcOGtl&t=11s)

## Coromant Capto Plus:

[https://www.sandvik.coromant.com/en-us/products/coromant\\_capto/Pages/coromant-capto-plus.aspx](https://www.sandvik.coromant.com/en-us/products/coromant_capto/Pages/coromant-capto-plus.aspx)



